

1 **CLAIMS**

2       1. A method for synchronizing information in namespaces, comprising:  
3       receiving an indication of a change to information in a first namespace;  
4       based on the indication, determining if an entity exists in a second  
5 namespace related to the information;  
6       if so, determining if the entity has a characteristic that conflicts with the  
7 information; and  
8       if a conflict exists, modifying the entity to resolve the conflict prior to  
9 applying the change to the second namespace.

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11       2. The method of claim 1, wherein the indication of the change  
12 comprises a notice that another entity was added to the first namespace.

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14       3. The method of claim 2, wherein the characteristic comprises a name  
15 of the other entity.

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17       4. The method of claim 3, wherein the conflict comprises a name  
18 collision between the entity in the first namespace and the entity in the second  
19 namespace.

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21       5. The method of claim 4, wherein modifying the entity in the second  
22 namespace comprises creating an indication that the characteristic of the entity in  
23 the second namespace has become invalid.

1           6.    The method of claim 5, wherein creating the indication comprises  
2 associating with the entity in the second namespace an indication that the name of  
3 the entity in the second namespace is no longer valid.

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5           7.    The method of claim 1, wherein the information in the first  
6 namespace comprises an entity in the first namespace.

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8           8.    The method of claim 1, wherein modifying the entity comprises  
9 altering the characteristic of the entity to eliminate the conflict.

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11          9.    The method of claim 8, wherein the characteristic comprises a name  
12 of the entity, and wherein altering the characteristic comprises modifying the name  
13 of the entity.

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15          10.   The method of claim 9, wherein modifying the name comprises  
16 replacing the name with a unique identifier.

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18          11.   The method of claim 9, wherein modifying the name comprises  
19 setting a flag associated with the entity to indicate that the name of the entity is  
20 transient.

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22          12.   A computer-readable medium having computer-executable  
23 instructions for performing the method of claim 1.

1       **13.** A method for synchronizing information in namespaces,  
2 comprising:

3       receiving an indication of a change to information in a first namespace;  
4       based on the indication, determining if an entity exists in a second  
5 namespace related to the information;  
6       if not, creating a representation of the entity within the second namespace.

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8       **14.** The method of claim 13, wherein the indication of the change  
9 comprises a notice of a reference to the entity in the second namespace.

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11       **15.** The method of claim 14, wherein the reference indicates that the  
12 information in the first namespace refers to the entity in the second namespace.

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14       **16.** The method of claim 15, wherein the representation of the entity  
15 comprises a phantom entity in the second namespace.

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17       **17.** The method of claim 16, wherein the phantom entity includes a flag  
18 indicating the state of the phantom entity.

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20       **18.** The method of claim 17, further comprising, receiving a second  
21 indication of a second change to information in the first namespace and in  
22 response to the second indication, modifying the state of the phantom entity.

1       19.    The method of claim 18, wherein the second indication comprises  
2 an instruction to create the entity in the second namespace.

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4       20.    A   computer-readable   medium   having   computer-executable  
5 instructions for performing the method of claim 13.

1           **21.** A technique for synchronizing entities within two namespaces,  
2 comprising:

3           while synchronizing the two namespaces:

4                 identifying a conflict between a change notification received from a  
5 first namespace and a state of information within a second namespace;

6                 creating a temporary entity within the second namespace that allows  
7 the synchronization to proceed without interference by the conflict; and

8                 if the conflict becomes resolved such that the temporary entity is no  
9 longer necessary, removing the temporary entity.

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11           **22.** The technique of claim 21, wherein the conflict becomes resolved  
12 by receiving a notice to delete the temporary entity.

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14           **23.** The technique of claim 21, wherein the conflict becomes resolved  
15 by receiving a notice to make the temporary entity permanent.

1       **24.** A computer-readable medium encoded with a data structure,  
2 comprising:  
3       a plurality of entities, each entity having  
4       a first field having a name, the name being unique across each entity  
5 in the data structure;  
6       a second field having an identity, the identity being globally unique;  
7 and  
8       a third field having a phantom property, the phantom property being  
9 operative to distinguish between a first state of the entity and a second state of the  
10 entity.  
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1           **25.** A computer-readable medium having computer-executable  
2 components, comprising:

3           a synchronization environment having an associated external namespace, an  
4 associated central namespace, and a synchronization mechanism, the  
5 synchronization mechanism being configured to receive change information from  
6 the external namespace that identifies a plurality of changes to at least one object  
7 in the external namespace, the synchronization mechanism being configured to  
8 receive the change information in a first order that differs from a second order, the  
9 second order being the temporal order in which the changes occurred to the at least  
10 one object in the external namespace, the synchronization mechanism further  
11 comprising a name resolving component and a placeholder component, the name  
12 resolving component being operative to avoid name collisions and the placeholder  
13 component being operative to avoid dangling references.

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15           **26.** The computer-readable medium of claim 25, wherein the central  
16 namespace includes a plurality of objects that are correlated to a corresponding  
17 plurality of objects in the external namespace.

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19           **27.** The computer-readable medium of claim 25, wherein the name  
20 collision comprises an error corresponding to two objects in the central namespace  
21 having similar names.

1       **28.**   The computer-readable medium of claim 27, wherein the name  
2 resolving component comprises a pair of subspaces, one subspace for transient  
3 objects, and the other subspace for non-transient objects.

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5       **29.**   The computer-readable medium of claim 28, wherein the transient  
6 objects comprise objects that have been identified as having a name that is no  
7 longer valid.

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9       **30.**   The computer-readable medium of claim 28, wherein the non-  
10 transient objects comprise objects that have not been identified as having a name  
11 that is no longer valid.

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13       **31.**   The computer-readable medium of claim 25, wherein the dangling  
14 reference comprises an error corresponding to one object in the central namespace  
15 referring to another object in the central namespace that does not yet exist.

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17       **32.**   The computer-readable medium of claim 31, wherein the  
18 placeholder component comprises an identifier on a phantom object in the central  
19 namespace.

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21       **33.**   The computer-readable medium of claim 32, wherein the phantom  
22 object comprises an object that is referred to by another object in the central  
23 namespace but which has not yet been formally created.